

# **IT2143 Visual Computing**

## **Group Project**

Group I1

# **Car Rental Management System**

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# 1. Introduction

Welcome to the comprehensive project report for the Car Rental Management System that named as "DriveIt". This project represents the collaborative efforts of our team. Design and developed the project using Windows forms application .NET framework, Microsoft Visual Studio and C# as the language.

The Car Rental Management System is designed to empower DriveIt administrators with a user-friendly platform to manage their reservations, and overall business operations. The system incorporates key features such as vehicle inventory management, reservation processing, customer details management, real-time updates the details, and adding the details of the users who can manage the system. Developed using Microsoft Visual Studio with C# and the .NET Framework, the system is optimized for the Windows Forms environment, ensuring reliability and performance.

This report will delve into the project's objectives, the methodology employed during the development phase, implementation details, conclusion and references. We invite you to explore the journey of creating this innovative solution and the potential it holds for improving car rental services.

## 2. Objectives

The project aims to achieve the following:

- 1) Efficient Reservation Management:
  - Develop a user-friendly interface for DriveIt administrators to efficiently manage and process reservations, providing a streamlined experience for staff.
- 2) Comprehensive Vehicle Inventory Control:
  - Implement a robust system for the management of the vehicle inventory, allowing administrators to add new vehicles, update details, and delete old ones seamlessly.
- 3) Enhanced Customer Details Management:

- Design features for the comprehensive management of customer details, enabling administrators to maintain accurate records of the customer such as name, phone number and the address.
- 4) Real-time Updates showing:
    - Integrate real-time updates in database showing on the system screen to keep administrators informed about details, such as new reservations, overdue maintenance, and customer maintenance.
  - 5) User Access Management:
    - Implement user access controls to define roles and permissions, ensuring that only authorized individuals can access and manage functionalities within the system.
  - 6) Optimized System Performance:
    - Develop the Car Rental Management System using Microsoft Visual Studio with C# and the .NET Framework, optimizing the application for the Windows Forms environment to ensure reliability, performance, and a smooth user experience.
  - 7) Scalability and Future Expansion:
    - Design the system with scalability in mind, allowing DriveIt to easily expand its operations by accommodating additional vehicles, locations, and features.

### 3. Methodology

The successful development of the Car Rental Management System for "DriveIt" involved a systematic and collaborative approach, incorporating various methods and tools to ensure a comprehensive solution.

Employed **Agile project management methodologies**, including regular sprint planning and retrospectives, to facilitate effective collaboration within the team. Used Github to control the developing process.

## **I. Requirement Gathering**

Conducted detailed discussions with group members and analyzed the specific requirements of "DriveIt" to understand their business processes, challenges, and expectations from the Car Rental Management System.

## **II. Tools and Technologies**

Based on the requirements and the design phase, selected Microsoft Visual Studio as the integrated development environment (IDE) and C# as the programming language. The .NET Framework was chosen for its robustness and compatibility with Windows Forms application development. Figma used as the prototyping tool.

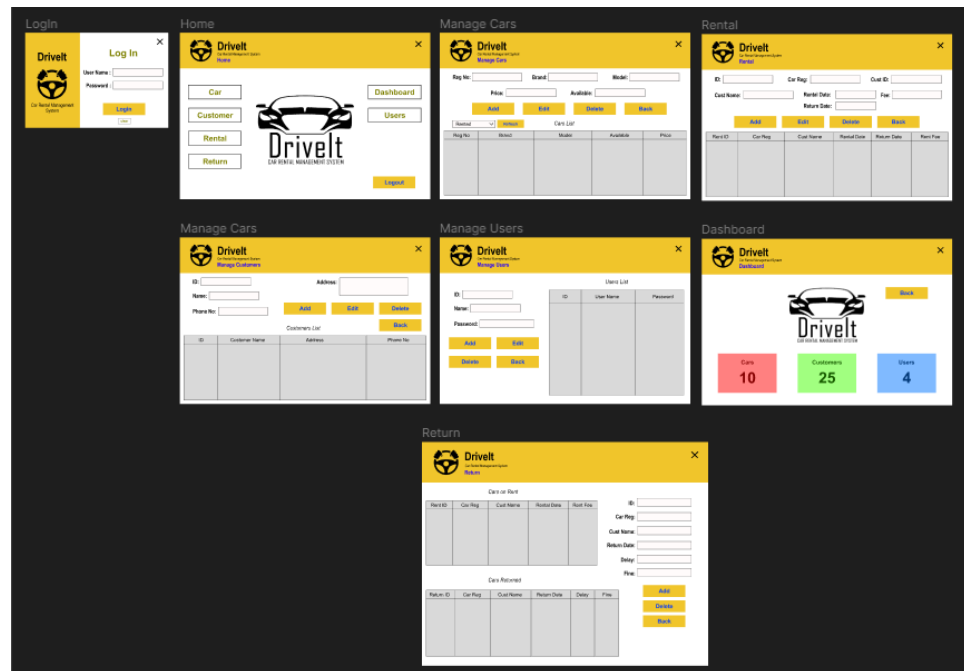
## 4. Implementation

Implemented the core functionalities of the Car Rental Management System using C# and adhering to best coding practices. Regular code reviews were conducted to ensure code quality, maintainability, and adherence to project guidelines.

### I. Interface Design

Before started the project we have deigned the outcome UI using Figma to get an idea how the system is going to perform.

Utilized the Windows Forms application framework within Microsoft Visual Studio for designing the graphical user interface (GUI).



*Figma UI and prototyping of the system*

Visit the following link to see the figma file and get an experience on how the system is going to work by running the figma file. (prototyped)

Link;

<https://www.figma.com/file/5eV6kmCKiKVnKvlgBx5n0P/Drivelt?type=design&node-id=0%3A1&mode=design&t=ofaPwaq6B1ufhhlh-1>

## II. Database

Employed Microsoft SQL Server for database management. Designed the database schema to efficiently store and retrieve data related to vehicles, reservations, customer details, and other relevant information

## III. Output

Tables;

*Car table*

	Name	Data Type	Allow Nulls
PK	RegNo	varchar(50)	<input type="checkbox"/>
	Brand	varchar(50)	<input type="checkbox"/>
	Model	varchar(50)	<input type="checkbox"/>
	Available	varchar(50)	<input type="checkbox"/>
	Price	varchar(50)	<input type="checkbox"/>

*Customer table*

	Name	Data Type	Allow Nulls
PK	CustID	int	<input type="checkbox"/>
	CustName	varchar(50)	<input type="checkbox"/>
	CustAdd	varchar(50)	<input type="checkbox"/>
	Phone	varchar(50)	<input type="checkbox"/>

*Rental table*

	Name	Data Type	Allow Nulls
PK	RentID	int	<input type="checkbox"/>
	CarReg	varchar(50)	<input type="checkbox"/>
	CustName	varchar(50)	<input type="checkbox"/>
	RentalDate	date	<input type="checkbox"/>
	ReturnDate	date	<input type="checkbox"/>
	RentFee	int	<input type="checkbox"/>

*Return table*

	Name	Data Type	Allow Nulls
PK	ReturnID	int	<input type="checkbox"/>
	CarReg	varchar(50)	<input type="checkbox"/>
	CustName	varchar(50)	<input type="checkbox"/>
	ReturnDate	varchar(50)	<input type="checkbox"/>
	Delay	varchar(50)	<input type="checkbox"/>
	Fine	int	<input type="checkbox"/>

*User table*

	Name	Data Type
PK	Id	int
	Uname	varchar(50)
	Upassword	varchar(50)

## 5. Conclusion

In conclusion, the development of the Car Rental Management System for "DriveIt" represents a significant milestone in our project journey. Through collaborative efforts and a systematic approach, our team has successfully created a robust and user-friendly solution designed to enhance the efficiency of car rental operations.

The project's objectives were meticulously addressed, resulting in a system that empowers DriveIt administrators with advanced reservation management, comprehensive vehicle inventory control, and real-time updates. The user-friendly interface, developed using Microsoft Visual Studio with C# and the .NET Framework, ensures reliability and performance within the Windows Forms environment.

The methodology employed, from requirement analysis to deployment, followed best practices in software development. The iterative and agile approach allowed for adaptability to changing requirements and ensured the delivery of a high-quality product.

The database output showcases a well-structured schema with interconnected tables, supporting seamless data retrieval and management. Relationships between tables contribute to data integrity, while example queries demonstrate the system's capability to handle various scenarios effectively.

Through documentation and knowledge transfer, this project not only delivers a tangible solution for DriveIt but also provides a foundation for future development and maintenance.

As we reflect on the journey of creating this innovative Car Rental Management System, we anticipate its positive impact on improving operational processes, customer service, and overall business competitiveness. The success of this project is attributed to the dedication, collaboration, and technical expertise of each team member.



## 6. References

- [1] Microsoft. (n.d.). Visual Studio Documentation. [Online].  
Available: <https://docs.microsoft.com/en-us/visualstudio/>
- [2] Microsoft. (n.d.). .NET Documentation. [Online].  
Available: <https://docs.microsoft.com/en-us/dotnet/>
- [3] SQL Server Documentation. (n.d.). [Online].  
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